STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

REPORTS OF THE
DIVISION OF WATER RESOURCES
EDWARD HYATT, STATE ENGINEER

REPORT ON

WATER MASTER SERVICE

WITHIN

SURPRISE VALLEY WATER MASTER DISTRICT

MODOC COUNTY, CALIFORNIA

FOR THE SEASON OF 1941

BY

J. VICTOR SCAMMON
Assistant Water Master

SACRAMENTO, CALIFORNIA

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EDWARD HYATT, STATE ENGINEER
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Department of Public Works

SACRAMENTO

DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING

October 20, 1941

Mr. Harold Conkling
Deputy State Engineer
Sacramento, California

Attention: Mr. Gordon Zander,
Supervising Hydraulic Engineer

Dear Sir:

The annual report covering water master service within the Surprise Valley Water Master District, Modoc County, California, during the 1941 season, is transmitted herewith.

The report covers a general description of the work and a summary of the distribution of water on each stream within the district. Records of precipitation, run-off and other pertinent data are included.

Respectfully submitted,

HS:CS

J. VICTOR SCAMMON
Assistant Water Master

INTRODUCTION

Water master service was continued in the Surprise Valley Water Master District during the 1941 season in accordance with the provisions of Section 37a of the Water Commission Act. The service was commenced for the season on March 19th, and was terminated on September 30th.

J. Victor Scammon, Deputy Water Master, Surprise Valley Water Master District, administered the distribution of water from the streams within the district during the entire period. Harrison Smitherum, Supervising Water Master, directed the work in the field.

WATER SUPPLY

Precipitation

Table 1 contains precipitation data compiled from records of the U. S. Weather Bureau kept at Cedarville. The monthly and seasonal precipitation for 1940-41 is given and compared with the mean for the seasonal years 1894-1941. The 1940-1941 records show the precipitation of that season as 123.4 per cent of the mean.

Table 2 contains the results of the snow surveys made annually at three courses in the Upper Pit River watershed. The two snow courses on the Warner Range, namely Eagle Peak and Cedar Pass, show that the water content of the snow was 69.0 per cent and 80.7 per cent, respectively, of their deduced normals. A mean between these two figures is 74.8 per cent.

Stream Flow

Measuring stations, equipped with water stage recorders, were maintained on the streams within the Surprise Valley Water Master District as listed below. The streams are listed geographicaly in order from north to south. As nearly as practicable each station is located above all

diversions on the particular stream. On Pine Creek the measurements were made by means of two 4.0 foot Parshall Measuring Flumes installed at the point where the stream divides into the North and South Channels. The other stations were rated by means of current meter measurements taken at various stages of the streams throughout the period of water master service. The records of discharge for the several streams within the district are presented in Tables 3 to 15, inclusive, submitted at the end of this report. The adequacy of the water supply to fill the requirements on the various streams is discussed for each stream under the chapter heading "Distribution of Water ".

Mill Creek above diversions.
Soldier Creek above diversions.
Pine Creek above North and South Channels.
Cedar Creek above diversions.
North Deep Creek above diversions.
South Deep Creek below Espil Ditch.
Owl Creek below Allen-Arreche Ditch.
Rader Creek above Parshall Flume Diversion Structure.
Eagle Creek one-half mile below mouth of canyon.
Emerson Creek above diversions.

DISTRIBUTION OF WATER

Mill Creek

All ditches on Mill Creek where opened during the season of 1941 with the exception of the Mill Ditch, Diversion 1, which has not been used for several years because of the condition of the flume. It is probable that this ditch will not be used again as a diesel engine has been installed to operate the flour mill. The flour mill for the past few years has diverted water from the South Channel of Mill Creek through a three quarter inch pipe from about September 15 to such time as the mill ceases operations in the fall of each year.

The water supply was ample for all demands in April and May as many of the ranchers had not commenced to irrigate. In June no shortage was felt. The third priority water was not exhausted until the latter part of July. The

water supply gradually decreased and for a short period subsequent to August 20 there was no water available for the second priority rights. Full allotments were available for the first priority rights throughout the entire season, except for about one week subsequent to August 25, when allotments were reduced to 90 per cent of the decreed amounts.

To aid in distribution rotation was practiced on Rutheford Creek between the Vernon (Raker) and Warrens Ranches during the period from June 8 to about July 5. Fourth priority water for the Vernon place did not fail until July 20. The Bennett Collecting Ditch was not cleaned this year and as a result very little water was available for the lands watered by this ditch. The daily discharge of Mill Creek for 1941 is shown in Table 3.

Soldier Creek

All ditches on Soldier Creek were opened in 1941, and all users exercised their full legal rights whenever water was available therefor. During April and May some water was available for all the rights.

Rotation was practiced from March 19 until June 19, in accordance with the decree. Simpson Canyon and Daniels Canyon supplied 100 per cent allotment to the Daniel Ranch until May 15 so that no diversion from Soldier Creek was necessary for the Daniels right during that period. However, Simpson Canyon failed entirely about June 1 and the flow of Daniels Canyon dropped from 1.50 c.f.s. on May 1 to 0.70 c.f.s. on June 1, making necessary an increasing diversion from Soldier Creek after June 1 to fill the Daniels allotment.

During the Lower Users first irrigation period water was rotated between the two channels. The first six days flow was allotted to the West Channel and the remaining seven days were allotted to the East Channel.

Full allotments were available during most of the days in the remaining rotation periods.

During the Upper Users first two rotation periods, there were full allotments available most of the time with about two thirds of total allotments available in their third period. Some irrigation water remained for the second priority rights even in the final period. After June 19 the creek continued to fail so that only 75 per cent of first priority was available in August.

A new two foot concrete Parshall Measuring Flume was installed by the water master during the later part of the season in the Warrens Flood Ditch, Diversion 2. The material was furnished by George Warrens. A new headgate of sufficient height was installed by Oliver Crampton in his Upper Ditch, Diversion 4.

The daily discharge of Soldier Creek for 1941 is shown in Table 4.

Pine Creek

The water supply on Pine Creek was sufficient to complete the first and second rotations by May 13. The third rotation was started with Bowers and Tierney receiving 18.8 acre-feet and 16.4 acre-feet, respectively. By May 17 the flow had dropped to 4.0 c.f.s. and Gaustad was turned on but during the day much snow fell in the water shed of Pine Creek so that on May 18 the creek rose to over 6.0 c.f.s. and Bowers was given the water for a day to finish out his rotation allotment of 30.0 acre-feet. On May 20 the water was given back to Gaustad and from May 21 to 23, inclusive, McCulley was given the flow. On May 24 Gaustad received water for the day and on May 25 the flow of the creek had receded to 1.8 c.f.s. at which time the creek was turned into the Cressler Ditch for W. E. Hill. On the evening of June 4 the water was turned to J. Freeborn. Some water continued to flow to the Freeborn corral throughout the remaining part of the season because the Royce place did not exercise their garden right.

The daily discharge of Pine Creek for 1941 is snown in Table 5

Cedar Creek

Water was available in varying amounts for all rights on Cedar Creek in 1941. Table 6 is a tabulation of the daily discharge including the foreign water diverted from Thoms Creek through the Cedar Pass Ditch. This ditch was opened April 25 and ceased to flow about July 10, although on several rainy days during the remaining part of the season flows were observed as high as 1.00 c.f.s.

The first priority right of the McCulley Ditch to the Cedar Creek water was only partially exercised during April, May and most of June, but was brought to full allotment about June 12, and thereafter diverted all that was available under its right. Stock and garden water was available at the Mc Culley Ranch all season.

Some difficulty was experienced in keeping the diversion dam at the head of the McCulley Ditch in place. On many occasions it was found broken and large rocks were piled against the McCulley headgate. The water master and L. McCulley built the dam up each time but could not find the party guilty of molesting the point of diversion.

On June 10 the Company Ditch was allowed to divert all water passing its point of diversion as insufficient water was in the creek to reach the Beebe Ranch. On June 12 the water ceased to reach even the head of the Company Ditch.

Deep Creek

North Deep Creek: Water was available for 100 per cent allotments to first priority rights up to May 10, dropped to 52 per cent by June 1, and receded gradually to a low of 5 per cent allotments during the first two weeks of August. Aided by above normal precipitation during the summer months, the flow was sufficient to reach all first priority class users throughout the low period. Ordinarily the water will fail to reach

these users subsequent to July 20.

South Deep Creek: The flow of this stream supplied 100 per cent allotments in the first priority class up to June 10, decreased to 30 per cent by July 1 and reached a low of 13 per cent on July 20. There was no appreciable decrease throughout the remainder of the season.

Deep Creek below junction North and South Deep Creeks: Water was available only for short periods in April and May for varying percentages of allotments in the second to fifth priority classes, inclusive, however, due to a limited use by the first priority users, the second to fifth priority users received full allotments during April and May.

Records of daily discharge for 1941 for North Deep Creek, South Deep Creek, and North and South Deep Creeks combined are shown in Table 7, 8 and 9, respectively.

Owl Creek

After May 7 Owl Creek had a surplus of water and water ran into the lake until the later part of June. The Dalton Ditch was allowed to remain open until July 23 because the McClintock Ditch did not divert its full allotment until that time. Domestic and stock water was furnished the McClintock, Heryford, Cummins, and Ennis-Arreche ranches throughout the season. This was made possible by the unusually cool, rainy weather. Rotation was practiced between the users on the Allen-Arreche, Wade and Chase Ditches, the details of which were arranged and handled by the individual users. Water was available for the special orchard rights in July, such right being exercised only by the Arreche Ranch.

The daily discharge of Owl Creek for 1941 has been tabulated in Table 10.

Rader Creek

Water was available to fill the demands of all priorities on Rader Creek until about June 1. By August 25, the water supply had failed so that only 50 per cent of first priority allotments was available.

On May 20, the McCulley-Hudspeth Ditch was opened and regulated to divert one seventh of the flow of the creek at the point of diversion. The amount diverted into the ditch on said date was 2.0 c.f.s. The ditch was closed July 25 when the water failed to reach the place of use. Due to several local rains in Hornback Canyon, Hornback Creek was still running enough water to reach the McCulley Ranch on July 25. On August 9, the main creek below the concrete diversion structure, consisting of four Parshall measuring flumes, was closed off for the season and Powers' water was delivered by way of the Powers-Miura Ditch. Stock water was available throughout the season for Woodruff, Minto, Powers, and Miura.

The daily discharge of Rader Creek for 1941 at the measuring station has been tabulated in Table 11. The daily discharge above all diversions has been tabulated in Table 12.

Eagle Creek

The flow of Eagle Creek was low until warm weather began melting the higher snow on about May 8. Prior to that time only a partial supply of water was available for third priority rights, but with the increased warm weather full allotments for all users were available until June 20. Rotation was unnecessary except as provided in the decree for the town users. A copy of the schedule used for these rights has been included in the 1940 Surprise Valley Report on Water Master Service.

A two foot Parshall was installed in the Gee Ditch, material for which was furnished by Grace Street. The carpenter work and installation was done by the water master.

The daily discharge of Eagle Creek for 1941 at the measuring station has been tabulated in Table 13. The daily discharge above all diversions has been tabulated in Table 14.

Emerson Creek

Water was available for all users on Emerson Creek for varying lengths of time during the season. The highest period of flow occurred from May 8 to 14, during which time water was available to the owners of fourth priority rights. Third priority rights were supplied full allotments until May 28. The second priority rights were able to divert from full to partial heads from April 26 to June 3. No shortage of first priority water occurred during the season.

New nine inch Parshall Measuring Flumes were installed in the Warren Ditch and Taylor Ditch. Material was furnished by the respective owners and the labor by the water master.

The Brown and Warren Ranch operators rotated in the use of their combined allotments during the irrigation season. The rotation was handled by the participants after approval of the water master.

The daily discharge of Emerson Creek for 1941 has been tabulated in Table 15.

TABLE 1

PRECIPITATION AT CEDARVILLE, CALIFORNIA, 1894-1941 - ELEVATION 4675 FEET
Monthly, Seasonal and Average Amounts in Inches

Season	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Seasonal
1940-1941	1.04	1.40	1.23	1.38	1.41	1.77	0.67	.58	1.77	1.33	1.32	1.09	14.99
Mean 1894-1941	.54	1.03	1.50	1.48	1.74	1.51	1.47	.91	.92	.67	.21	.16	12.14
1940-1941 in Percent of Total Mean	8.5	11.5	10.1	11.4	11.6	14.6	5.5	4.8	14.6	10.9	10.9	9.0	123.4

NOTE: See Soldier Creek reports for previous records.

TABLE 2

SNOW SURVEY DATA - UPPER PIT RIVER

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
Eagle Peak Course Elev. 7500 ft. Date of Survey	4/3	4/1	3/30	3/30	4/2	4/10	4/9	3/29	3/31	3/30	4/30	3/26
Depth of Snow - Inches	24.3	13.3	43.8	38.1	9.9	66.1	52.0	47.3	71.3	27.2	38.4	35.1
Water Content - Inches	11.0	5.2	18.7	14.3	3.3	22.6	22.0	17.5	23.6	10.4	15.6	13.8
Density - per cent	45.3	39.1	42.6	37.5	33.3	34.2	42.3	37.1	33.1	38.2	40.6	39.3
Deduced Normal Water Content								20.0	20.0	20.0	20.0	20.0
% of Deduced Norm	55.0	27.0	94.0	71.5	16.5	113.0	110.0	87.5	118.0	52.0	78.0	69.0
Record Average-In								14.32	15.35	14.8	14.9	14.8
% of Record Aver.	78.0	36.3	131.0	100.0	23.0	158.0	154.0	122.0	153.7	70.5	104.7	93.3
Cedar Pass Course Elev. 7200 ft. Date of Survey	3/31	3/31	3/26	3/28	3/31	3/27	4/5	4/10	3/26	3/28	3/22	3/24
Depth of Snow-In.	29.3	22.1	49.2	43.9	2.2	56.4	68.2	54.2	79.1	28.2	35.9	40.8
Water Content-In.	13.0	8.0	19.8	16.3	0.9	21.1	26.2	21.6	25.2	10.5	14.6	17.9
Density - Percent	44.4	37.6	40.3	37.1	40.8	37.4	38.4	40.0	31.8	37.2	40.7	43.8
Deduced Normal Water Content								22.2	22.2	22.2	22.2	22.2
% of Deduced Normal	58.7	36.1	88.4	73.4	4.1	98.2	118.0	97.4	114.0	47.4	65.8	80.7
Record Average-In								15.9	16.9	16.3	16.1	16.3
% of Record Average	82.0	50.4	118.0	102.5	5.7	133.0	165.0	136.0	149.1	64.4	90.7	109.0
Adin Mountain Course - Elev. 6500 ft. Date of Survey	3/27	3/27	3/24	3/27	4/1	4/17	3/26	4/7	4/8	3/31	4/7	3/31
Depth of Snow-In.	13.3	6.1	30.0	37.6	0	45.9	47.2	37.4	61.4	17.5	10.8	24.6
Water Content-In.	6.1	2.9	13.3	14.1	0	18.8	20.0	16.7	28.1	8.1	4.3	11.3
Density -Per cent	45.6	47.3	44.3	37.5	0	40.9	42.3	44.8	45.8	46.2	39.8	45.9
Deduced Normal Water Content								16.1	16.1	16.1	16.1	16.1
% of Deduced Norm	37.9	18.0	82.5	87.6	0	116.6	124.3	104.0	174.	50.2	26.7	70.2
Record Average-In								11.5	13.3	12.8	12.0	12.0
% of Record Aver.	53.0	25.2	115.6	122.5	0	163.7	174.0	145.2	211.3	63.3	35.8	94.1

TABLE 3

Daily Discharge in Cubic Feet Per Second
MILL CREEK ABOVE DIVERSIONS
April 1 to September 30, 1941.

Day	Apr.	May	June	July	Aug.	Sept.
1	12.6	23.5	24.0	9.5	3.0	1.9
2	12.0	23.0	30.0	9.5	2.8	3.0
3	11.8	24.0	30.0	8.6	2.8	2.6
4	11.8	29.0	30.0	8.4	2.6	2.2
5	10.8	37.0	28.4	7.9	2.6	2.2
6	10.6	37.0	34.0	7.6	2.4	2.2
7	10.6	37.0	35.0	6.4	2.2	2.2
8	11.5	50.0	30.0	6.2	2.2	2.0
9	12.0	55.0	27.0	6.2	2.2	1.8
10	12.6	55.0	18.5	6.2	2.2	1.8
11	11.9	56.0	18.5	6.2	3.6	1.9
12	11.8	50.0	18.0	6.2	3.0	2.0
13	11.8	50.0	22.4	6.0	2.6	2.0
14	11.0	46.0	18.5	5.6	2.6	2.0
15	10.4	42.0	17.4	5.6	2.4	2.0
16	14.2	41.0	16.0	5.2	2.2	2.0
17	13.4	42.0	13.0	5.0	3.0	2.0
18	12.4	41.0	18.5	4.7	2.8	2.4
19	12.0	40.0	22.4	4.7	2.4	3.0
20	12.6	40.0	14.4	3.8	2.0	2.6
21	14.0	40.0	13.2	3.6	2.2	2.4
22	14.0	40.0	13.0	3.6	2.0	2.4
23	8.4	40.5	13.0	3.6	1.8	2.2
24	12.0	40.5	13.1	3.8	1.8	2.0
25	15.0	41.0	11.6	3.8	1.8	1.9
26	17.4	43.0	13.0	3.8	1.8	2.0
27	22.0	40.0	14.0	4.0	1.8	2.0
28	23.0	40.0	13.0	3.3	1.8	2.0
29	22.0	30.0	10.4	3.3	2.8	2.0
30	21.0	28.0	9.8	3.3	2.6	2.0
31		28.0		3.0	1.9	
Total	406.6	1229.5	590.1	168.6	73.9	64.7
Mean	13.6	39.6	19.6	5.4	2.4	2.2
Run-off in Acre-feet	807.	2440	1170	334	147	128

Total run-off 183 day period 5030 acre-feet.

TABLE 4

Daily Discharge in Cubic Feet per Second
SOLDIER CREEK ABOVE DIVERSIONS
April 1 to September 30, 1941

Day	Apr.	May.	June	July	Aug.	Sept.
1	9.2	40.0	9.0	4.7	2.2	2.6
2	8.0	41.0	8.8	4.5	2.2	3.1
3	7.4	41.0	9.0	4.2	2.2	2.6
4	7.1	31.0	8.5	4.0	2.2	2.3
5	6.5	33.6	8.0	3.9	2.1	2.3
6	6.8	31.5	11.4	3.9	2.1	2.3
7	6.8	32.6	12.4	3.9	1.9	2.3
8	6.0	44.0	8.5	3.9	2.0	2.4
9	5.6	41.0	7.5	3.4	1.9	2.4
10	5.3	39.5	7.4	3.2	1.9	2.4
11	7.2	39.0	7.0	3.1	2.2	2.4
12	7.4	36.5	6.8	3.1	2.2	2.4
13	9.2	26.8	6.5	2.8	2.2	2.5
14	12.0	23.0	6.2	2.4	2.1	2.3
15	13.0	20.6	5.7	2.4	1.9	2.2
16	11.0	22.0	5.2	2.4	2.2	2.2
17	8.8	22.0	5.4	2.3	2.2	2.1
18	7.7	20.6	6.8	2.3	2.2	2.2
19	7.7	15.4	9.0	2.4	2.0	2.2
20	8.0	15.4	5.1	2.7	2.0	2.1
21	9.2	18.0	5.1	2.7	2.5	2.1
22	14.2	18.0	5.1	2.4	2.6	2.1
23	17.4	17.4	5.1	2.5	2.5	2.1
24	19.0	16.5	5.4	2.5	2.4	2.1
25	22.3	18.0	5.4	2.4	2.2	2.1
26	26.8	18.8	7.4	2.4	2.2	2.1
27	28.6	18.0	7.4	2.5	2.3	2.1
28	31.5	16.5	4.9	2.5	2.3	2.1
29	22.0	12.4	4.9	2.4	2.3	2.1
30	31.5	10.0	5.0	2.3	2.4	2.1
31		9.0		2.3	2.4	
Total	383.2	789.1	209.9	92.4	68.0	68.3
Mean	12.8	25.4	7.0	3.0	2.2	2.3
Run-off in Acre-feet	760.	1570.	416.	183.	135.	135.

Total runoff 183 day period 3200 acre-feet.

TABLE 5

Daily Discharge in Cubic Feet per Second
PINE CREEK ABOVE NORTH AND SOUTH CHANNELS
March 20 to June 19, 1941

Day	Mar.	Apr.	May	June
1		7.2	11.2	0.8
2		7.2	12.4	.7
3		5.7	18.0	.6
4		5.4	10.0	.6
5		5.4	10.0	.6
6		5.2	7.5	.6
7		5.5	7.7	.6
8		6.2	11.9	.6
9		6.8	9.5	.5
10		6.0	8.7	.5
11		5.8	6.5	.5
12		5.7	5.9	.5
13		6.8	4.9	.5
14		7.3	4.5	.5
15		6.8	4.2	.5
16		5.3	4.0	.5
17		4.2	5.0	.5
18		2.8	6.0	.5
19		3.2	5.0	.5
20	5.2	4.5	2.7	
21	5.2	5.5	2.4	
22	5.5	6.2	2.2	
23	5.0	7.1	2.1	
24	4.8	9.4	2.0	
25	5.8	7.9	1.6	
26	7.3	11.2	1.5	
27	9.1	11.2	1.4	
28	8.9	11.0	1.2	
29	7.8	10.2	1.0	
30	7.8	11.2	0.9	
31	7.8		0.9	
Total	*80.2	203.9	172.8	**10.6
Mean	* 6.6	6.8	5.6	** 0.6
Run-off in Acre-feet	*159.	404.	343.	**21.0

Total run-off 92 day period 927 acre-feet.
*12 day period.
**19 day period.

TABLE 6

Daily Discharge in Cubic Feet per Second
CEDAR CREEK ABOVE DIVERSIONS
March 18 to September 21, 1941

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1		13.0	20.0	7.6	2.6	0.8	0.8
2		12.4	19.0	6.5	2.4	1.0	2.0
3		12.4	19.0	6.5	2.3	0.9	1.5
4		12.0	19.0	6.5	2.1	0.9	1.1
5		10.0	18.5	6.5	2.0	0.7	1.1
6		10.9	18.5	7.5	3.2	0.7	1.0
7		10.0	18.0	8.4	2.0	0.6	1.0
8		10.5	30.0	6.3	1.9	0.6	0.8
9		11.5	26.0	5.7	1.7	0.7	.7
10		11.0	22.0	4.4	1.6	0.6	.5
11		10.9	18.0	4.0	1.6	1.4	.5
12		10.5	16.0	3.8	1.6	1.2	.6
13		10.9	16.5	4.2	1.5	1.1	.6
14		10.9	16.5	3.7	1.5	1.1	.6
15		10.0	15.5	3.4	1.6	1.2	.7
16		11.5	15.0	3.4	1.8	1.1	.8
17		10.9	16.0	4.0	1.5	1.1	.7
18		9.8	16.5	3.8	1.5	1.1	.7
19	11.5	9.5	12.6	5.2	1.4	1.2	.7
20	11.0	10.0	12.0	3.6	1.3	1.0	.6
21	10.0	10.9	11.0	3.4	1.3	1.6	.6
22	10.0	11.0	10.8	3.1	1.1	1.6	
23	10.0	11.5	9.7	2.6	0.9	1.3	
24	9.5	15.0	8.5	2.6	0.9	1.1	
25	9.6	14.5	10.5	2.7	0.8	1.0	
26	11.3	18.0	11.5	3.1	1.0	1.0	
27	13.5	18.0	10.6	5.1	1.3	1.0	
28	15.0	18.0	9.9	4.1	1.4	0.9	
29	14.5	16.5	9.4	3.1	1.0	0.8	
30	14.5	18.0	9.8	2.7	1.1	0.9	
31	14.5		9.8		1.0	0.9	
Total	*154.9	370.0	476.1	137.5	48.9	31.1	**17.6
Mean	* 11.9	12.3	15.4	4.6	1.6	1.0	** 0.8
Run-off in Acre-feet	*307.	734.	944.	273.	97.	61.7	**34.9

Total run-off 187 day period 2450 acre-feet.
*13 day period.
**21 day period.

TABLE 7

Daily Discharge in Cubic Feet Per Second
NORTH DEEP CREEK ABOVE DIVERSIONS
April 1 to September 25, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1	5.0	11.0	4.3	1.2	0.5	0.7
2	5.2	12.8	3.6	1.1	.4	1.4
3	4.9	14.0	4.6	1.1	.3	.9
4	4.5	11.0	4.3	1.0	.3	.9
5	4.5	11.0	3.9	.9	.4	.8
6	4.3	9.8	4.6	.9	.3	.8
7	4.1	10.4	5.9	.8	.3	.8
8	3.6	16.0	4.6	.8	.3	.8
9	3.6	16.0	3.9	.9	.3	.7
10	3.6	15.0	3.0	.8	.3	.7
11	3.6	12.8	3.0	.8	.6	.7
12	3.6	12.2	2.9	.7	.6	.7
13	3.6	9.8	2.7	.6	.6	.7
14	3.6	8.8	2.5	.6	.6	.7
15	4.0	6.2	2.2	.6	.5	.7
16	4.1	6.2	2.2	.8	.7	.7
17	4.1	6.2	2.1	.8	.9	.7
18	3.6	5.8	2.7	.7	.7	.8
19	3.6	5.2	2.9	.5	.5	1.0
20	3.7	5.0	2.5	.5	.6	1.0
21	3.6	4.5	2.1	.5	.5	0.9
22	4.5	4.3	1.9	.4	.6	.9
23	4.9	4.3	1.7	.4	.7	.9
24	4.9	4.3	1.7	.8	.7	.9
25	6.0	5.0	1.8	.8	.8	.8
26	6.0	5.9	1.7	.8	.7	
27	7.0	5.9	1.9	.8	.7	
28	7.4	5.9	1.7	.7	.7	
29	7.4	5.2	1.4	.6	.8	
30	8.8	4.6	1.2	.5	.8	
31		5.0		.5	.8	
Total	141.3	260.1	85.5	22.9	17.5	*20.6
Mean	4.7	8.4	2.8	0.8	0.6	* 0.8
Run-off in Acre-feet	280	516	170.	45.4	34.7	*40.8

Total run-off 178 day period 1090 acre-feet.
*25 day period.

TABLE 8

Daily Discharge in Cubic Feet Per Second
SOUTH DEEP CREEK BELOW ESPIL DITCH
April 1 to September 25, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1	7.8	11.2	6.8	1.8	0.6	0.6
2	7.8	11.2	6.4	1.6	.6	.6
3	7.3	12.2	5.4	1.5	.6	.6
4	7.3	7.8	5.0	1.0	.6	.6
5	6.6	6.6	6.3	1.4	.6	.6
6	6.3	10.0	8.1	1.5	.5	.5
7	5.8	10.0	10.0	1.2	.5	.5
8	6.6	17.8	8.4	1.2	.6	.5
9	7.3	15.1	7.1	.9	.6	.5
10	7.0	13.6	6.3	.8	.6	.5
11	6.6	13.2	5.8	.7	1.0	.5
12	6.3	13.2	5.0	.9	.9	.5
13	6.6	13.2	5.0	.8	.9	.5
14	7.5	12.6	4.9	.9	.9	.5
15	8.5	11.6	4.0	1.0	.8	.5
16	7.5	10.0	2.7	1.0	1.1	.5
17	6.8	9.8	2.5	1.0	.9	.4
18	6.3	9.8	4.9	.8	.7	.5
19	5.8	9.4	4.7	.7	.6	.4
20	8.0	6.8	3.2	.6	.6	.4
21	7.0	7.0	3.0	.7	.6	.4
22	8.6	6.8	2.8	.6	.6	.4
23	10.0	6.7	2.4	.5	.5	.4
24	11.2	6.7	2.5	.6	.6	.4
25	11.2	7.2	2.4	.7	.5	.4
26	10.4	8.0	2.4	.9	.5	
27	10.4	8.5	3.1	.9	.6	
28	11.9	9.2	2.6	.7	.5	
29	11.9	7.6	2.3	.7	.5	
30	12.2	7.2	2.0	.6	.5	
31		7.6		.6	.5	
Total	244.5	307.6	138.0	28.8	20.1	*12.2
Mean	8.2	9.9	4.6	0.92	0.65	* 0.48
Run-off in Acre-feet	485.	610.	274.	57.1	39.9	*24.2

Total run-off 178 day period 1490 acre-feet
*25 day period.

TABLE 9

Daily Discharge in Cubic Feet Per Second
NORTH AND SOUTH DEEP CREEKS ABOVE DIVERSIONS
April 1 to September 25, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1	12.7	22.2	11.1	3.0	1.1	1.3
2	13.0	24.0	10.0	2.7	1.0	2.0
3	14.2	26.2	10.0	2.6	.9	1.5
4	11.8	18.8	9.3	2.0	.9	1.5
5	10.6	18.3	10.2	2.3	1.0	1.4
6	10.6	19.8	12.7	2.4	.8	1.3
7	9.90	22.1	15.9	2.0	.8	1.3
8	10.2	35.5	13.0	2.0	.9	1.3
9	10.9	32.8	11.0	1.8	.9	1.2
10	10.6	29.2	9.3	1.6	1.0	1.2
11	10.2	26.0	8.8	1.5	1.6	1.2
12	9.90	25.4	7.9	1.6	1.5	1.2
13	10.2	23.0	7.7	1.4	1.5	1.2
14	11.1	21.4	7.4	1.5	1.5	1.2
15	12.5	18.5	6.2	1.6	1.3	1.2
16	11.6	16.2	4.9	1.8	1.8	1.2
17	12.9	16.0	4.6	1.8	1.8	1.1
18	9.90	15.6	7.6	1.5	1.4	1.3
19	11.2	14.6	7.6	1.2	1.1	1.4
20	11.7	11.8	5.7	1.1	1.2	1.4
21	12.3	11.5	5.1	1.2	1.1	1.3
22	14.9	11.1	4.7	1.0	1.2	1.3
23	16.6	11.0	4.1	.9	1.2	1.3
24	18.9	11.0	4.2	1.4	1.3	1.3
25	20.0	11.0	4.0	1.5	1.3	1.2
26	18.3	13.9	4.1	1.7	1.2	
27	19.3	14.4	5.0	1.7	1.3	
28	20.2	15.1	4.3	1.4	1.2	
29	20.2	12.8	3.7	1.3	1.3	
30	29.0	10.6	3.2	1.1	1.3	
		12.6		1.1	1.3	
Total	415.5	572.4	223.3	51.7	37.7	*32.8
Mean	13.8	18.5	7.4	1.67	1.21	* 1.31
Runoff in acre feet	824.	1130.	443.	102.	74.8	*65.0

Total run-off 178 day period 2640 acre-feet

* 25 day period

TABLE 10

Daily Discharge in Cubic Feet Per Second
OWL CREEK BELOW ALLEN-ARRECHE DITCH
April 1 to September 30, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1	8.6	35.6	13.0	13.6	3.5	3.2
2	8.6	33.2	13.0	13.0	3.0	48.0
3	8.6	33.5	13.6	13.0	3.0	6.0
4	8.2	27.2	20.0	13.0	2.5	4.8
5	8.2	29.2	38.0	12.4	2.5	4.3
6	8.4	29.2	38.0	12.4	2.5	3.8
7	8.6	33.2	39.0	9.8	2.5	3.8
8	8.8	70.0	39.0	9.8	2.5	3.8
9	9.7	50.0	40.0	9.5	2.5	3.4
10	9.7	50.0	40.0	8.6	2.5	3.2
11	9.2	51.0	40.0	8.6	5.5	2.7
12	8.8	51.0	37.5	8.6	3.4	2.7
13	8.8	52.0	35.0	8.6	3.3	2.7
14	9.2	57.0	34.0	7.4	2.9	2.7
15	9.5	50.0	28.0	6.6	2.6	2.7
16	9.7	59.0	29.5	6.6	2.6	2.7
17	9.7	58.0	26.5	6.4	2.6	2.7
18	8.8	43.0	29,5	6.0	2.6	2.4
19	8.5	39.2	28.0	5.8	3.7	2.4
20	9.5	33.2	25.0	5.4	3.7	2.4
21	11.8	30.0	26.5	5.4	4.3	2.4
22	17.0	31.8	29.5	5.4	4.1	2.4
23	19.0	39.2	23.0	4.8	3.7	2.4
24	23.0	48.0	22.0	4.3	3.4	2.4
25	18.4	49.0	18.5	4.3	3.3	2.3
26	20.2	52.0	17.5	4.3	3.3	2.4
27	24.8	51.0	24.0	5.4	3.3	2.4
28	25.2	44.0	19.0	4.6	3.2	2.4
29	26.2	37.5	17.0	3.9	3.4	2.4
30	40.0	35.0	14.4	3.5	3.4	2.4
31		15.6		3.5	3.3	
Total	404.7	1317.6	818.0	234.5	98.6	134.3
Mean	13.5	42.5	27.2	75.6	3.2	4.5
Run-off in Acre-feet	802.	2610	1620	465.	196.	286.

Total run-off 183 day period 5980 acre-feet.

TABLE 11

Daily Discharge in Cubic Feet Per Second
RADER CREEK ABOVE PARSHALL DIVISION STRUCTURE
April 1 to September 30, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1	3.1	15.5	10.3	4.9	1.0	0.5
2	3.0	15.5	10.3	4.9	1.0	1.4
3	3.0	15.5	12.1	4.6	1.0	1.0
4	3.0	13.5	13.0	4.3	1.0	.7
5	3.0	11.5	13.0	4.0	.9	.7
6	3.0	11.4	16.5	3.8	.8	.6
7	3.0	11.5	17.5	2.9	.7	.5
8	3.0	36.0	14.6	2.7	.7	.5
9	3.0	36.0	10.3	2.6	.9	.5
10	3.0	40.0	8.3	2.6	.9	.5
11	2.8	50.0	8.3	2.3	1.4	.4
12	2.8	38.0	8.0	2.2	.9	.4
13	2.6	29.0	8.3	2.1	.7	.4
14	3.1	23.0	10.2	2.1	.6	.4
15	3.5	19.0	10.2	1.9	.6	.4
16	3.5	19.0	10.2	1.9	.6	.4
17	3.5	20.0	8.3	1.9	.9	.4
18	3.3	19.0	10.2	1.6	.8	.3
19	3.3	16.5	9.5	1.5	.7	.4
20	3.7	11.5	8.3	1.4	.5	.4
21	5.0	10.1	8.0	1.4	.5	.4
22	6.5	12.2	7.3	1.2	.4	.4
23	6.5	11.7	7.3	1.1	.4	.4
24	7.5	18.5	6.1	1.1	.4	.4
25	7.5	19.0	5.2	.9	.4	.4
26	9.0	20.0	5.5	1.1	.4	.4
27	10.5	18.5	5.7	1.2	.5	.4
28	11.5	16.0	5.2	1.1	.5	.4
29	12.5	12.0	5.2	1.1	.7	.4
30	13.5	11.0	4.9	1.0	.6	.4
31		11.5		1.1	.5	
Total	152.2	611.9	277.8	68.5	21.9	14.8
Mean	5.1	19.7	9.3	2.2	0.7	0.5
Run-off in Acre-feet	302.	1210.	551.	136.	43.4	29.0

Total run-off 183 day period 2270 acre-feet.

TABLE 12

Daily Discharge in Cubic Feet Per Second
RADER CREEK ABOVE DIVERSIONS
April 1 to September 30, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1	3.6	16.0	12.5	6.2	1.5	.7
2	3.5	16.0	12.5	6.2	1.4	1.6
3	3.5	16.0	14.6	5.4	1.3	1.2
4	3.5	14.0	15.7	5.5	1.2	.9
5	3.5	12.0	15.7	5.3	1.1	.9
6	3.5	11.9	19.8	4.9	1.1	.8
7	3.5	12.0	20.9	3.9	.9	.7
8	3.5	36.5	17.5	3.6	.9	.7
9	3.5	36.5	12.5	3.5	1.1	.7
10	3.5	40.5	10.2	3.5	1.1	.7
11	3.3	50.5	10.2	3.2	1.7	.6
12	3.3	38.5	9.8	3.1	1.1	.6
13	3.1	29.5	10.2	3.0	.9	.6
14	3.6	23.5	12.4	3.0	.8	.6
15	4.0	19.5	12.4	2.8	.8	.6
16	4.0	19.5	12.4	2.8	.8	.6
17	4.0	20.5	10.2	2.8	1.1	.6
18	4.8	19.5	12.4	2.4	1.0	.5
19	4.8	17.0	11.6	2.2	.9	.6
20	4.2	13.9	10.2	2.2	.7	.6
21	5.5	12.3	9.8	1.9	.7	.6
22	7.0	14.7	9.0	1.7	.6	.6
23	7.0	14.1	9.0	1.6	.6	.6
24	8.0	22.1	7.6	1.6	.6	.6
25	8.0	22.7	6.6	1.4	.6	.6
26	9.5	23.8	6.9	1.6	.6	.6
27	11.0	22.1	7.1	1.7	.7	.6
28	12.0	19.2	6.6	1.6	.7	.6
29	13.0	14.5	6.6	1.6	.9	.6
30	14.0	13.5	6.2	1.5	.8	.6
31		13.9		1.6	.7	
Total	169.2	656.2	339.1	93.3	28.9	20.8
Mean	5.6	21.1	11.3	3.0	0.90	0.70
Run-off in Acre-feet	336.	1300.	672.	185.	57.0	41.0

Total run-off 183 day period 2590 acre-feet.

TABLE 13

Daily Discharge in Cubic Feet per Second
EAGLE CREEK ONE-HALF MILE BELOW MOUTH OF CANYON
April 1 to September 22, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1	6.2	27.5	30.5	18.5	6.2	4.0
2	5.9	25.0	27.4	18.5	4.6	9.4
3	5.2	24.0	26.6	18.5	4.4	6.2
4	5.2	20.2	29.0	17.7	4.6	4.9
5	4.6	16.4	32.0	16.2	6.2	4.7
6	5.2	16.4	36.0	16.2	5.8	4.0
7	4.6	20.2	36.0	16.2	5.8	4.4
8	5.2	55.0	29.0	15.6	5.8	4.4
9	5.2	51.0	29.0	14.2	5.8	4.0
10	4.6	50.0	29.0	13.0	5.8	4.0
11	4.6	52.0	32.0	13.0	8.6	4.0
12	4.6	60.0	39.5	12.0	5.8	4.0
13	5.2	42.0	44.0	10.8	5.6	4.0
14	6.6	50.0	44.0	10.4	5.2	4.0
15	6.4	50.0	42.0	10.4	5.2	4.0
16	6.2	50.0	41.0	10.4	4.9	4.0
17	5.5	50.0	38.0	10.9	5.9	4.0
18	4.9	42.0	41.0	9.9	5.9	4.0
19	5.5	32.0	39.5	8.6	4.6	4.0
20	6.6	32.0	32.0	8.1	4.4	4.0
21	9.0	40.0	25.3	7.7	4.6	4.0
22	11.4	50.0	20.2	6.9	4.4	4.0
23	13.6	55.0	20.0	6.9	4.4	
24	15.5	57.0	20.0	6.9	4.0	
25	14.9	55.0	20.0	6.9	4.1	
26	16.3	57.0	22.0	7.3	4.0	
27	18.6	44.0	20.0	6.9	4.4	
28	23.0	44.0	19.5	6.9	4.4	
29	22.0	40.0	18.5	6.2	4.9	
30	25.0	33.0	18.5	5.8	4.6	
31		32.0		5.8	4.4	
Total	277.3	1272.5	901.5	343.3	159.3	*98.0
Mean	9.2	41.0	30.0	11.1	5.1	*4.4
Run-off in Acre-feet	550.	2520.	1780.	681.	316.	*194.

Total run-off 175 day period 6050 acre-feet.
*22 day period.

TABLE 14

Daily Discharge in Cubic Feet per Second
EAGLE CREEK ABOVE DIVERSIONS
April 1 to September 22, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1	6.7	28.0	31.3	19.0	6.7	4.5
2	6.5	25.5	28.2	19.0	5.1	9.9
3	5.7	24.5	27.4	19.0	4.9	6.7
4	5.7	20.7	29.8	18.2	5.1	5.4
5	5.1	16.9	32.8	16.7	6.7	5.2
6	5.7	16.9	36.8	16.7	6.3	4.5
7	5.2	20.7	36.8	16.7	6.3	4.9
8	5.7	56.0	29.8	16.1	6.3	4.9
9	5.7	52.0	29.8	14.7	6.3	4.5
10	5.1	51.0	29.8	13.5	6.3	4.5
11	5.1	53.0	32.8	13.5	9.1	4.5
12	5.1	61.0	40.3	12.5	6.3	4.5
13	5.7	43.0	44.8	11.3	6.1	4.5
14	7.1	51.0	44.8	10.9	5.7	4.5
15	6.9	51.0	42.8	10.9	5.7	4.5
16	6.7	51.0	41.8	10.9	5.4	4.5
17	6.0	51.0	38.8	11.4	6.4	4.5
18	5.4	43.0	41.8	10.4	6.4	4.5
19	6.0	33.0	39.5	9.1	5.1	4.5
20	7.1	33.0	32.8	8.6	4.9	4.5
21	9.5	41.0	26.1	8.2	5.1	4.5
22	11.9	51.0	21.0	7.4	4.9	4.5
23	14.1	56.0	20.8	7.4	4.9	
24	16.0	58.0	20.8	7.4	4.5	
25	15.4	56.0	20.8	7.4	4.6	
26	16.8	58.0	22.8	7.8	4.5	
27	19.1	45.0	20.8	7.4	4.9	
28	23.5	45.0	20.3	7.4	4.9	
29	22.5	41.0	19.3	6.7	5.4	
30	25.5	34.0	19.3	6.3	5.1	
31		33.0		6.3	4.9	
Total	292.5	1300.2	924.7	358.8	174.8	*109.0
Mean	9.8	41.9	30.8	11.6	5.6	* 4.9
Run-off in Acre-feet	580	2570	1830	712	347	*216

Total run-off 175 day period 6270 acre-feet.

* 22 day period

TABLE 15

Daily Discharge in Cubic Feet per Second
EMERSON CREEK ABOVE DIVERSIONS
April 1 to September 25, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1	7.6	17.5	14.0	7.6	3.0	2.8
2	7.4	17.5	13.6	7.0	3.0	3.9
3	6.5	17.5	13.6	6.4	2.8	3.5
4	6.5	16.2	12.7	6.4	2.7	3.4
5	6.0	16.8	12.0	6.0	2.7	3.0
6	6.2	17.0	14.0	5.5	2.7	2.8
7	6.2	18.0	14.0	5.0	2.7	2.8
8	6.2	30.2	12.0	4.8	2.5	2.8
9	6.5	29.6	11.6	4.6	3.0	2.7
10	6.4	28.5	11.4	4.4	2.7	2.7
11	6.0	29.0	10.9	4.1	4.1	2.8
12	5.8	29.0	10.6	4.1	3.9	2.8
13	6.0	28.5	9.9	4.0	3.5	2.8
14	6.5	26.4	9.5	4.1	3.2	2.8
15	8.0	23.4	8.8	3.9	3.0	2.8
16	7.9	22.3	9.5	3.9	2.8	2.8
17	7.6	22.3	9.2	4.1	3.2	2.8
18	7.4	21.0	10.9	3.5	3.2	2.8
19	7.0	18.5	9.5	3.4	3.2	2.8
20	7.1	18.0	8.2	3.0	3.0	2.8
21	7.6	17.6	7.6	2.8	3.0	2.8
22	9.6	17.6	7.0	2.8	3.0	2.8
23	10.9	18.5	7.0	3.0	2.8	2.8
24	12.4	18.9	8.6	3.4	2.8	2.8
25	13.2	19.4	7.6	3.4	2.7	2.8
26	13.6	22.3	8.0	3.5	2.7	
27	14.0	21.0	9.2	3.7	3.2	
28	14.8	20.4	7.6	3.5	3.0	
29	16.2	18.5	6.8	3.5	3.5	
30	14.4	16.4	6.4	3.2	3.0	
31		15.4		3.2	2.8	
Total	261.5	653.2	301.7	131.8	93.4	*72.4
Mean	8.7	21.1	10.0	4.2	3.0	*2.9
Run-off in Acre-feet	518	1300	598	261	185	*144

Total run-off 178 day period 3010 acre-feet.
*25 day period.